Jan. 2, 1945. J. KUNZ 2,366,199

MOTION TRANSMITTING MECHANISM

Original Filed Aug. 3, 1940 2 Sheets-Sheet 1

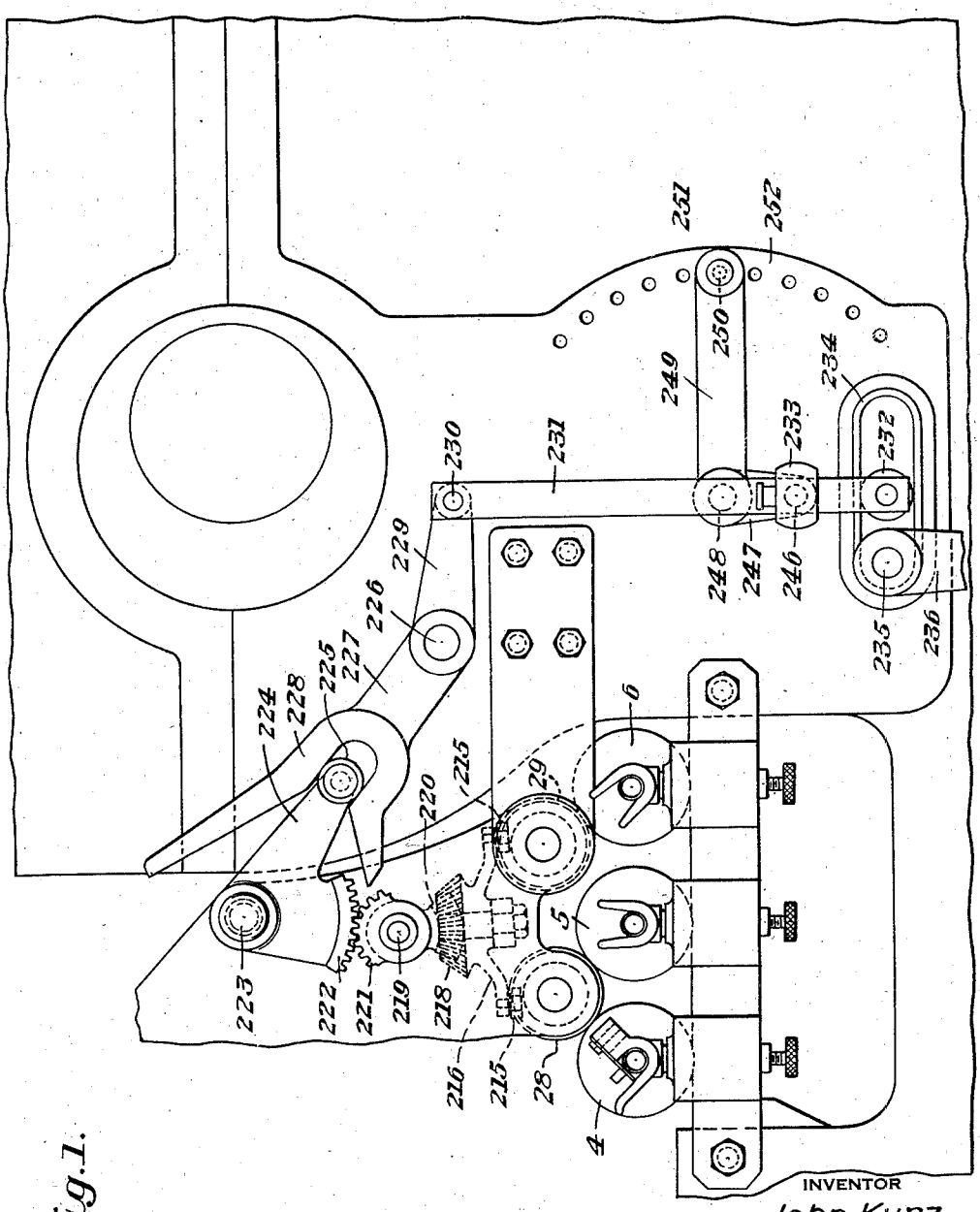


Fig. 1.

INVENTOR
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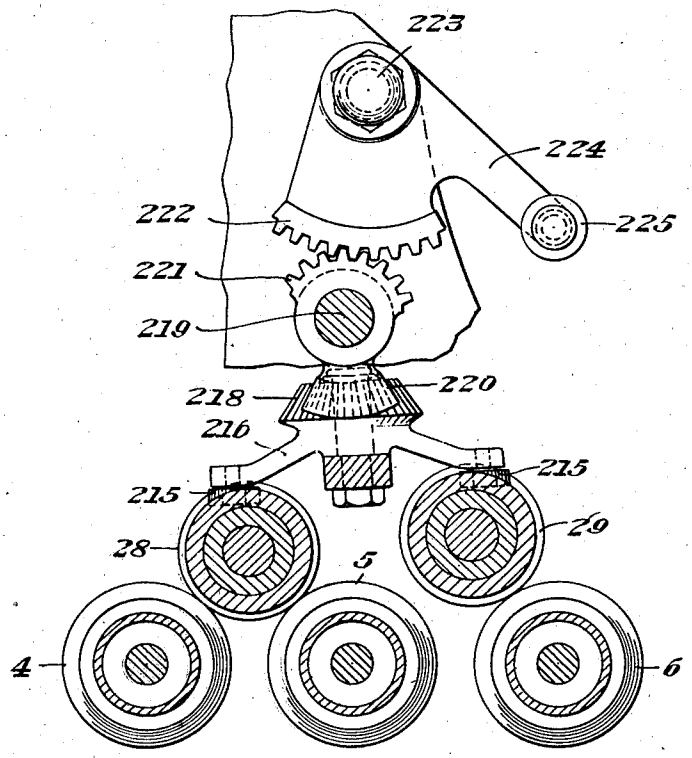
by Stubbins and Ellis
his attorneys

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MOTION TRANSMITTING MECHANISM

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Fig. 2.



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MOTION TRANSMITTING MECHANISM

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Original application August 3, 1940, Serial No. 350,705. Divided and this application October 17, 1941, Serial No. 415,403

13 Claims. (Cl. 74—96)

This invention relates to motion transmitting mechanism. It relates more particularly to means for transmitting oscillatory motion. It relates still more particularly to means for transmitting oscillatory motion from an oscillating driving member to an oscillating driven member while providing for control and adjustment of the relative amplitude of oscillation of said members. This application is a division of my copending application Serial No. 350,705, filed August 3, 1940.

While the invention is of wide application I have found it to be particularly adaptable to an inker and purely for purposes of explanation and illustration the invention will herein be described as applied to an inker. An inker delivers ink to a printing form for printing sheets. The ink is delivered to the form by what are known in the art as form inking rollers or simply form rollers. In order to properly distribute the ink upon the form rollers there are provided distributing rollers which contact the surfaces of the form rollers and oscillate or vibrate axially, these rollers being known in the art as vibrator rollers. Since the vibrator rollers are arranged with their axes extending transversely of the inker means must be provided for vibrating them in the transverse direction. However, the power to vibrate or oscillate the vibrator rollers is ordinarily derived from a member which oscillates in a vertical longitudinal plane. Consequently oscillating motion has to be transmitted between a member oscillating in a vertical longitudinal plane and the vibrator rollers which oscillate in a horizontal transverse plane.

Various means for transmitting the vibratory or oscillatory motion from the driving means to the vibrator rollers have heretofore been provided and they have accomplished the function after a fashion. However, such means have in many cases been unduly complicated and expensive and inefficient in operation. Definite limitations have been imposed upon the amplitude of vibration of the vibrator rollers. Moreover, no practical means has been provided for adjusting the amplitude of vibration of the vibrator rollers while the inker is in operation or for effecting amplitude adjustment throughout a wide range.

I provide means for transmitting oscillatory or vibratory motion from a driving member oscillating in a vertical longitudinal plane to the vibrator rollers which oscillate or vibrate in a horizontal transverse plane. The motion is transmitted efficiently and in such a way as to provide for maximum amplitude of vibration of the vibrator rollers when desired. Moreover, provision is made for adjusting the amplitude of vibration of the vibrator rollers without changing the amplitude of oscillation of the driving means and without necessitating stopping operation of the inker or the press with which the inker is used. The mechanism is simple and efficient in operation and of low cost.

Other details, objects and advantages of the invention will become apparent as the following description of a present preferred embodiment of the invention proceeds.

In the accompanying drawings I have shown a present preferred embodiment of the invention, in which

Figure 1 is a fragmentary elevational view of an inker showing my motion transmitting mechanism; and

Figure 2 is a fragmentary vertical longitudinal cross-sectional view of a portion of the structure shown in Figure 1 but to enlarged scale.

Referring now more particularly to the drawings, there is shown an inker having form rollers **4**, **5** and **6** for delivering ink to a printing form which oscillates horizontally in contact with the under surfaces of such form rollers. The ink is delivered to and distributed upon the form rollers by distributor vibrator rollers **28** and **29**. The vibrator roller **28** engages the form rollers **4** and **5** and the vibrator roller **29** engages the form roller **6**. The vibrator rollers may be driven if desired, although the means for driving them if employed forms no part of the present invention and is not shown. The vibrator rollers are vibrated or oscillated axially in opposite directions, that is, when the roller **28** is moving away from the viewer in Figure 2 the roller **29** is moving toward the viewer and vice versa. Also means is provided for altering within a wide range the amplitude of oscillation of the vibrator rollers. Such means and the means for oscillating the vibrator rollers will now be described.

Each of the vibrator rollers **28** and **29** is rotatably mounted in bearings (not shown) in the inker frame. The bearings allow for axial vibration of the rollers during operation of the inker. Each roller has adjacent one end thereof a circular cam groove within which is disposed a roller **215**. The respective rollers **215** are rotatably mounted on the opposite ends of a lever **216** pivoted to the inker frame and having integral therewith a bevel gear **218**. A stub shaft **219**

is mounted in the frame and carries at one end a bevel pinion 220 meshing with the bevel gear 218. At its other end the stub shaft 219 carries a spur pinion segment 221 meshing with a spur gear segment 222 pivoted to the frame at 223 and having an arm 224 extending generally downwardly and longitudinally of the inker and carrying at its extremity a roller 225. Means presently to be described is provided for oscillatably swinging the arm 224 about the axis of the pivot 223 whereby to oscillate the gear segment 222 and hence through the pinion segment 221 the bevel pinion 220 and the bevel gear 218 to oscillate the lever 216 about its vertical pivot. Since the rollers 215 are in the circular cam grooves in the vibrator rollers 28 and 29 this oscillatory movement causes lengthwise oscillation or vibration of the vibrator rollers 28 and 29.

Mounted in the frame is a stub shaft 226 to which is fixed an arm 227 having at its extremity a fork 228 adapted to receive the roller 225 as shown in Figure 1. The shaft 226 is adapted to oscillate, such oscillation being imparted to the fork 228 and through it to the roller 225 and the arm 224. The shaft 226 carries an arm 229 which is fixed thereto and which arm 229 has pivoted thereto at its opposite end at 230 a downwardly extending link or rod 231 carrying at its lower end a roller 232. The rod 231 is guided for generally vertical sliding movement generally longitudinally of itself by a guide collar 233 through which the rod passes and which is adapted to be adjustably positioned as will presently be described. The roller 232 rides within a hollow arm 234 fixed to a shaft 235 mounted in the frame. Also fixed to the shaft 235 is a generally downwardly extending arm 236 which lies and operates in a vertical longitudinal plane and is adapted to be oscillated by the driving mechanism for the inker or press. The arm 236 constitutes the source of power so far as the mechanism with which the present application deals is concerned.

Oscillation of the arm 236 causes oscillation of the shaft 235 and corresponding oscillation of the hollow arm 234 which is fixed to the shaft 235. This in turn causes generally up and down sliding movement of the rod 231 in the guide collar 233. This movement will, of course, be accompanied by some relative movement longitudinally of the hollow arm 234 between such arm and the roller 232.

If the guide collar 233 is moved toward the right, viewing Figure 1, the amplitude of oscillatory movement imparted by the mechanism just described to the shaft 226 and the arm 229 thereon will be increased because the roller 232 will then be cooperating with a portion of the hollow arm 234 farther removed from the center of turning 235 of such arm. Such movement of the guide collar 233 is provided for through its being pivotally mounted at 246 upon the lower end of an arm 247 fixed to a shaft 248 in the frame. Also fixed to the shaft 248 is an arm 249 carrying at its outer extremity a spring pressed pin 250 adapted selectively to enter one of an arcuate series of holes 251 in a plate 252 forming a part of the frame. The series of holes 251 is arranged in an arc about the axis of the shaft 248 and the spring pressed pin 250 may by pulling it out of whichever one of the holes it may be in, turning the arm 249 about the axis of the shaft 248 to another position and allowing the spring to project the pin inwardly, be positioned in any desired one of the holes 251. When the pin 250 is in a hole near the upper end of the arcuate series of holes 251 the guide collar 233 is moved toward the right, viewing Figure 1, and the amplitude of oscillation of the shaft 226 is increased. The contrary is true when the pin 250 is in a hole near the bottom of the arcuate series of holes 251. Indeed, when the roller 232 is coaxial with the shaft 235 the shaft 226 will not be oscillated at all despite continued oscillation of the shaft 235.

Thus by a very quick and simple manipulation the amplitude of oscillation or vibration of the vibrator rollers 28 and 29 may be adjusted. The means for vibrating these rollers and the means for adjusting the amplitude of vibration are such that a greater amplitude of vibration is provided for than has been feasible with mechanisms for the same purpose heretofore provided and amplitude adjustment may be effected throughout a wider range than heretofore. Moreover, the amplitude of vibration of the vibrator rollers may be changed during operation of the mechanism without the necessity of stopping it to make the adjustment.

While I have shown and described a present preferred embodiment of the invention it is to be distinctly understood that the invention is not limited thereto but may be otherwise variously embodied within the scope of the following claims.

I claim:

1. In combination, an angularly oscillatable member, a generally elongated oscillatable member, said members having a cam and follower connection whereby oscillation of one thereof causes oscillation of the other, guide means for the generally elongated oscillatable member with respect to which such member is generally longitudinally slidable upon oscillation and means for shifting the guide means generally transversely of said generally elongated oscillatable member to alter the relative positions of the cam and follower during oscillation of said members and control the relative amplitude of oscillation thereof.

2. In combination, an angularly oscillatable member, a second member operatively connected with the oscillatable member to be oscillated thereby but adapted while so connected to have its place of connection with the oscillatable member shifted along the oscillatable member, guide means having a slidable connection with the second member so as to allow the second member to partake of oscillatory movements imparted thereto by said oscillatable member, and a bell crank lever one arm of which carries said guide means and another arm of which is shiftable whereby to shift the place of engagement between the oscillatable member and the second member.

3. In combination, a slotted lever, a member operated by said lever having a portion engaging in and shiftable along the slot therein, guide means having a slidable connection with said member, and means for shifting said guide means to shift the place of engagement of said member on the slotted lever, said last mentioned means including a bell crank lever one arm of which carries said guide means and another arm of which is quickly shiftable to and fastenable in any desired one of a number of positions.

4. In combination, an angularly oscillatable member, a generally elongated oscillatable member, said members having a connection whereby

oscillation of one thereof causes oscillation of the other, said connection including portions whose relation may be altered to alter the amplitude of oscillation of the driven member in response to oscillation of predetermined amplitude of the driving member, a guide collar for the generally elongated oscillatable member within which such member is generally longitudinally slidable upon oscillation and means for shifting said guide collar to alter the relation of said portions.

5. In combination, an angularly oscillatable member, a generally elongated oscillatable member, said members having a connection whereby oscillation of one thereof causes oscillation of the other, said connection including portions whose relation may be altered to alter the amplitude of oscillation of the driven member in response to oscilaltion of predetermined amplitude of the driving member, guide means for the generally elongated oscillatable member with respect to which such member is generally longitudinally slidable upon oscillation, means including a rapidly swingable rotary operating member for swinging said guide means generally transversely of said generally elongated oscillatable member to alter the relation of said portions and a plurality of means arranged at intervals along the path of said operating member for maintaining said operating member selectively in a plurality of predetermined positions.

6. In combination, a pair of angularly oscillatable arms, a link joining said arms, said link being pivoted to one of said arms and having a connection with the other thereof adjustable along the arm and guide means for the link positioned intermediate the arms for determining the position of said adjustable connection along said second mentioned arm.

7. In combination a pair of angularly oscillatable arms, a link joining said arms, said link being pivoted to one of said arms and having a connection with the other thereof adjustable along the arm and guide means for the link with respect to which the link is generally longitudinally slidable, the link and the second mentional arm both turning and sliding relatively to each other upon oscillation.

8. In combination, a pair of angularly oscillatable arms, a link joining said arms, said link being pivoted to one of said arms and having a connection with the other thereof adjustable along such arm and whose position therealong determines the relative amplitude of oscillation of said arms, guide means for the link with respect to which the link is generally longitudinally slidable, the link and the second mentioned arm both turning and sliding relatively to each other upon oscillation, and means for shifting the guide means for adjusting said connection along said second mentioned arm.

9. In combination, a pair of angularly oscillatable arms, a link joining said arms, said link being pivoted to one of said arms and having a connection with the other thereof adjustable along the arm, guide means for the link for determining the position of said adjustable pivotal connection along said second mentioned arm, means including a rapidly shiftable operating member for shifting said guide means generally transversely of the link and means for maintaining said operating member selectively in a plurality of predetermined positions.

10. In combination, an angularly oscillatable member, a generally elongated oscillatable member, said members having a connection whereby oscillation of one thereof causes oscillation of the other, said connection including portions whose relation may be altered to alter the amplitude of oscillation of the driven member in response to oscillation of predetermined amplitude of the driving member, a normally stationary guide carrier, a guide for the generally elongated oscillatable member, said guide being carried by said carrier but freely movable relatively thereto in response to changes in angularity of the generally elongated oscillatable member during oscillation thereof, and means for shifting said carrier to alter the relation of said portions.

11. In combination, an angularly oscillatable member, a generally elongated oscillatable member, said members having a connection whereby oscillation of one thereof causes oscillation of the other, said connection including portions whose relation may be altered to alter the amplitude of oscillation of the driven member in response to oscillation of predetermined amplitude of the driving member, a normally stationary guide carrier, a guide for the generally elongated oscillatable member, said guide being pivoted to said carrier so as to turn freely relatively thereto in response to changes in angularity of the generally elongated oscillatable member during oscillation thereof, and means for shifting said carrier to alter the relation of said portions.

12. In combination, an angularly oscillatable member, a generally elongated oscillatable member, said members having a connection whereby oscillation of one thereof causes oscillation of the other, said connection including portions whose relation may be altered to alter the amplitude of oscillation of the driven member in response to oscillation of predetermined amplitude of the driving member, a bell crank lever, a guide for the generally elongated oscillatable member carried by one arm of said bell crank lever, said bell crank lever being operable to shift said guide to alter the relation of said portions, and means cooperating with the other arm of said bell crank lever for positioning the bell crank lever selectively in a plurality of predetermined positions.

13. In combination, a pair of angularly oscillatable arms, a link joining said arms, said link being pivoted to one of said arms and having a connection with the other thereof adjustable along the arm, a guide collar for the link within which the link is generally longitudinally slidable during operation and means for shifting said guide collar to determine the position of said adjustable connection along said second mentioned arm.

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